

### Trinomial.

They say this is like a polynomial that has three terms. this must be common in engineering, as it will have length, breadth and depth, yes?

 Quote by: <http://en.wikipedia.org/wiki/Trinomial>

1.  $3x + 5y + 8z$  with  $x, y, z$  variables
2.  $3t + 9s^2 + 3y^3$  with  $t, s, y$  variables
3.  $3ts + 9t + 5s$  with  $t, s$  variables
4.  $Ax^ay^bz^c + Bt + Cs$  with  $x, y, z, t, s$  variables,  $a, b, c$  nonnegative integers and  $A, B, C$  any constants.
5.  $Px^a + Qx^b + Rx^c$  where  $x$  is variable and constants  $a, b, c$  are nonnegative integers and  $P, Q, R$  any constants.

Let's do the first one first? [ $3x + 5y + 8z = p$ ] let's say that 3 becomes  $a$ , 5 becomes  $b$  and 8 becomes  $c$ , then you would have, [ $ax + by + cz$ ] and this would lead to then you could say, instead, as we know the numbers, we have [ $a3 + b5 + c8$ ] then, it would all be squared together, making it [ $9 + 25 + 64$ ], leading to 98? how do we check it? let's call a mathematician before we confirm this!

As you can see, you can cross reference the numbers to letters and back again, making for a much easier time.

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### Polynomials.

In maths, this is quite complicated for young high school students. if you were to observe the polynomial, you might get confused, but let's look at the example in the wiki?

$$5(x - 1) \left( x + \frac{1 + i\sqrt{3}}{2} \right) \left( x + \frac{1 - i\sqrt{3}}{2} \right)$$

This example is quite complex, isn't it? let's try to figure it out, simply, once again.

To me, this means  $5[x - 1] [x^2 \text{ times } 1/2 \{ = x \}]$  so it would be  $5 [x - 1]$  times by  $[x]$  and then it would be  $5x [2x - 1x]$  which leads to  $10x$  basically. now to look for patterns!

So, we want to find a quicker way to do this? don't you? if you were to look at the 5 times the divisor, then we would have our answer, yes?

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### I am sure there is an easier way to calculate!

If you need to insert values to a formula or sum, and you find it difficult to know what the answers are, i want to make a system where the sum can be calculated with minimal effort. if the sum has values where the values of something like  $x$  to the power of 4 to the power of 9 are hard to calculate, then i suggest you could just add the powers together, for example, and leave it  $x$  to the power of 36, so it would be  $x^{36}$ . then we could say, seeing as how it is multiplication, that  $x = 1$ , making  $x^{36} = 36$ , yes? that doesn't mean it works yet though! if there is only one  $x$ , then it can go down like that, easily, as the sums will be calculated on the 36.

If there are only a few 'letters' or 'symbols,' then the way to go about it will be to

cross out all the symbols, and keep the numbers. doing it the other way around will leave you with a sum you will not come back from, as maths is a language of values, not imagination. now we could do that for all of the symbols, and then have a lot of values easy to compute! Then, we could lose the brackets or just write the sum out in easy to understand equations.

If it is  $[x + 5] [y / 3]$  then we could say that it is actually, dropping all the symbols,  $+5 / 3 = 1.66$ , and, then we could say that it gets rounded up to a natural number, being 166! i wonder how that would fly?

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### Calculus made easy! [differential calculus.]

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 Quote by: <http://en.wikipedia.org/wiki/Calculus>

*Calculus is the mathematical study of change,[1] in the same way that geometry is the study of shape and algebra is the study of operations and their application to solving equations. It has two major branches, differential calculus (concerning rates of change and slopes of curves), and integral calculus (concerning accumulation of quantities and the areas under curves); these two branches are related to each other by the fundamental theorem of calculus. Both branches make use of the fundamental notions of convergence of infinite sequences and infinite series to a well-defined limit. Generally considered to have been founded in the 17th century by Isaac Newton and Gottfried Leibniz, today calculus has widespread uses in science, engineering and economics and can solve many problems that algebra alone cannot.*

*Calculus is a major part of modern mathematics education. A course in calculus is a gateway to other, more advanced courses in mathematics devoted to the study of functions and limits, broadly called mathematical analysis. Calculus has historically been called "the calculus of infinitesimals", or "infinitesimal calculus". The word "calculus" comes from Latin (calculus) and refers to a small stone used for counting. More generally, calculus (plural calculi) refers to any method or system of calculation guided by the symbolic manipulation of expressions. Some examples of other well-known calculi are propositional calculus, calculus of variations, lambda calculus, and process calculus.*

For differential calculus, we would want to find the meeting points of two lines on a cross section. to do this, we need to simply use a protractor on it, or, if it is too big, we need to use a protractor and a ruler of the right length. but that is obvious. if you want to do some linear algebra, where you find the "rise" and "run" of the lines, or to better explain linear algebra, the way it should be done...

 Quote by: <http://en.wikipedia.org/wiki/Calculus>

*If a function is linear (that is, if the graph of the function is a straight line), then the function can be written as  $y = mx + b$ , where  $x$  is the independent variable,  $y$  is the dependent variable,  $b$  is the  $y$ -intercept, and:*

Then, we need to find  $m$ . to find the answer, we need to square the prime function in  $f'(x)$ , meaning that we need to do  $x$  by the power of 2, then subtract  $x$ . let us test this again? if  $f'(x)$ , and  $x = 8$ , then the  $f'(8) = 62 - 8 = 74$ ?

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### Integral calculus made easy!

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 Quote by: <http://en.wikipedia.org/wiki/Calculus>

*Integral calculus is the study of the definitions, properties, and applications of two related concepts, the indefinite integral and the definite integral. The process of finding the value of an integral is called integration. In technical language, integral calculus studies two related linear operators.*

*The indefinite integral is the antiderivative, the inverse operation to the derivative.  $F$  is an indefinite integral of  $f$  when  $f$  is a derivative of  $F$ . (This use of lower- and upper-case letters for a function and its indefinite integral is common in calculus.)*

The definite integral inputs a function and outputs a number, which gives the algebraic sum of areas between the graph of the input and the x-axis. The technical definition of the definite integral is the limit of a sum of areas of rectangles, called a Riemann sum.

Distance = speed x time.

If the speed is constant, only multiplication is needed, but if the speed changes, then we need a more powerful method of finding the distance. One such method is to approximate the distance traveled by breaking up the time into many short intervals of time, then multiplying the time elapsed in each interval by one of the speeds in that interval, and then taking the sum (a Riemann sum) of the approximate distance traveled in each interval. The basic idea is that if only a short time elapses, then the speed will stay more or less the same. However, a Riemann sum only gives an approximation of the distance traveled. We must take the limit of all such Riemann sums to find the exact distance traveled.

When velocity is constant, the total distance traveled over the given time interval can be computed by multiplying velocity and time. For example, travelling a steady 50 mph for 3 hours results in a total distance of 150 miles. In the diagram on the left, when constant velocity and time are graphed, these two values form a rectangle with height equal to the velocity and width equal to the time elapsed. Therefore, the product of velocity and time also calculates the rectangular area under the (constant) velocity curve. This connection between the area under a curve and distance traveled can be extended to any irregularly shaped region exhibiting a fluctuating velocity over a given time period. If  $f(x)$  in the diagram on the right represents speed as it varies over time, the distance traveled (between the times represented by  $a$  and  $b$ ) is the area of the shaded region  $s$ .

To approximate that area, an intuitive method would be to divide up the distance between  $a$  and  $b$  into a number of equal segments, the length of each segment represented by the symbol  $\Delta x$ . For each small segment, we can choose one value of the function  $f(x)$ . Call that value  $h$ . Then the area of the rectangle with base  $\Delta x$  and height  $h$  gives the distance (time  $\Delta x$  multiplied by speed  $h$ ) traveled in that segment. Associated with each segment is the average value of the function above it,  $f(x)=h$ . The sum of all such rectangles gives an approximation of the area between the axis and the curve, which is an approximation of the total distance traveled. A smaller value for  $\Delta x$  will give more rectangles and in most cases a better approximation, but for an exact answer we need to take a limit as  $\Delta x$  approaches zero.

I would say it is down to  $x^2 + a = f$ , where  $x$  is the point you are examining and  $a$  equals the starting point.

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### Electrical engineering.

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Wouldn't it be great if we could teach college style electrical stuff to grade school kids? i am sure we can! hopefully we will see this in lower high school, or, even primary school. i know a lot of my friends knew about this sort of thing by grade 6, so hopefully there is a little luck inside, and we can teach this to them officially?

First off, we want to observe the resistor. basically, it comes down to  $V = RI$  and that is about as simple as it gets.

Now, when it gets to capacitors, they act as filters and store electric charge. basically, to find the current, you must take the dc value, and then divide volts by time, multiplying that by the capacitance. basically, you could multiply time by volts and multiply that by  $c$ ? this would be like my maths teacher once taught me, of course - flipping the division gets you to multiply.

So, if you have 20 volts by 3 time, you could remove decimal places, by, saying

that  $0.20$  times by  $0.03 = 0.06$  i think... and then you move it up two decimal places? this would give you  $6.6$ . but maybe there is an even easier way to divide?

If you had  $20 / 3$  you could say  $18/3 = 6$ , plus  $0.2 \times 3 = 0.6$  basically. if you had  $23 / 7$  you could say  $2.3 \times 7 = 16.1$  and add that to the answer without the decimal! so, if you have pie, for example, you could say  $22 / 7 = [21 / 7] + [1 \times 7]$  and place that value to the right of the decimal points.

So now you can work out your division much easier!

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## Functions.

 Quote by: [http://en.wikipedia.org/wiki/Function\\_\(mathematics\)](http://en.wikipedia.org/wiki/Function_(mathematics))


*In mathematics, a function<sup>[1]</sup> is a relation between a set of inputs and a set of permissible outputs with the property that each input is related to exactly one output. An example is the function that relates each real number  $x$  to its square  $x^2$ . The output of a function  $f$  corresponding to an input  $x$  is denoted by  $f(x)$  (read "f of x"). In this example, if the input is  $-3$ , then the output is  $9$ , and we may write  $f(-3) = 9$ . The input variable(s) are sometimes referred to as the argument(s) of the function.*

*Functions are "the central objects of investigation"<sup>[2]</sup> in most fields of modern mathematics. There are many ways to describe or represent a function. Some functions may be defined by a formula or algorithm that tells how to compute the output for a given input. Others are given by a picture, called the graph of the function. In science, functions are sometimes defined by a table that gives the outputs for selected inputs. A function could be described implicitly, for example as the inverse to another function or as a solution of a differential equation.*

*The input and output of a function can be expressed as an ordered pair, ordered so that the first element is the input (or tuple of inputs, if the function takes more than one input), and the second is the output. In the example above,  $f(x) = x^2$ , we have the ordered pair  $(-3, 9)$ . If both input and output are real numbers, this ordered pair can be viewed as the Cartesian coordinates of a point on the graph of the function. But no picture can exactly define every point in an infinite set.*

*In modern mathematics,<sup>[3]</sup> a function is defined by its set of inputs, called the domain, a set containing the outputs, called its codomain (or range), and the set of all paired input and outputs, called its graph. For example, we could define a function using the rule  $f(x) = x^2$  by saying that the domain and codomain are the real numbers, and that the ordered pairs are all pairs of real numbers  $(x, x^2)$ . Collections of functions with the same domain and the same codomain are called function spaces, the properties of which are studied in such mathematical disciplines as real analysis, complex analysis, and functional analysis.*

*In analogy with arithmetic, it is possible to define addition, subtraction, multiplication, and division of functions, in those cases where the output is a number. Another important operation defined on functions is function composition, where the output from one function becomes the input to another function.*

 Quote by: [http://en.wikipedia.org/wiki/Function\\_\(mathematics\)](http://en.wikipedia.org/wiki/Function_(mathematics))

*Image and preimage<sup>[edit]</sup>*

*Main article: Image (mathematics)*

*If  $A$  is any subset of the domain  $X$ , then  $f(A)$  is the subset of the codomain  $Y$  consisting of all images of elements of  $A$ . We say the  $f(A)$  is the image of  $A$  under  $f$ . The image of  $f$  is given by  $f(X)$ . On the other hand, the inverse image (or preimage, complete inverse image) of a subset  $B$  of the codomain  $Y$  under a function  $f$  is the subset of the domain  $X$  defined by*

$$f^{-1}(B) = \{x \in X : f(x) \in B\}.$$

So, for example, the preimage of  $\{4, 9\}$  under the squaring function is the set  $\{-3, -2, 2, 3\}$ . The term range usually refers to the image,<sup>[7]</sup> but sometimes it refers to the codomain.

By definition of a function, the image of an element  $x$  of the domain is always a single element  $y$  of the codomain. Conversely, though, the preimage of a singleton set (a set with exactly one element) may in general contain any number of elements. For example, if  $f(x) = 7$  (the constant function taking value 7), then the preimage of  $\{5\}$  is the empty set but the preimage of  $\{7\}$  is the entire domain. It is customary to write  $f^{-1}(b)$  instead of  $f^{-1}(\{b\})$ , i.e.

$$f^{-1}(b) = \{x \in X : f(x) = b\}.$$

This set is sometimes called the fiber of  $b$  under  $f$ .

Use of  $f(A)$  to denote the image of a subset  $A \subseteq X$  is consistent so long as no subset of the domain is also an element of the domain. In some fields (e.g., in set theory, where ordinals are also sets of ordinals) it is convenient or even necessary to distinguish the two concepts; the customary notation is  $f[A]$  for the set  $\{f(x) : x \in A\}$ . Likewise, some authors use square brackets to avoid confusion between the inverse image and the inverse function. Thus they would write  $f^{-1}[B]$  and  $f^{-1}[b]$  for the preimage of a set and a singleton.

So, if the equation is as it states, we can find a new quick fix by taking the answer, which we would be looking for except it is is given, and seeing where there are 'sub sums.' if you look at this directly,  $f$  to the power of minus one will divide the number or value by itself, leaving 1. then, you cube the  $x$ , or multiply it by itself twice, and then you can find  $b$  or  $x$  or whatever you are looking for.

 Quote by: [http://en.wikipedia.org/wiki/Function\\_\(mathematics\)](http://en.wikipedia.org/wiki/Function_(mathematics))

*Inverse function*<sup>[edit]</sup>

Main article: *Inverse function*

An inverse function for  $f$ , denoted by  $f^{-1}$ , is a function in the opposite direction, from  $Y$  to  $X$ , satisfying

$$f \circ f^{-1} = \operatorname{id}_Y, \quad f^{-1} \circ f = \operatorname{id}_X.$$

That is, the two possible compositions of  $f$  and  $f^{-1}$  need to be the respective identity maps of  $X$  and  $Y$ .

As a simple example, if  $f$  converts a temperature in degrees Celsius  $C$  to degrees Fahrenheit  $F$ , the function converting degrees Fahrenheit to degrees Celsius would be a suitable  $f^{-1}$ .

$$\begin{aligned} f(C) &= \frac{9}{5} C + 32 \\ f^{-1}(F) &= \frac{5}{9} (F - 32) \end{aligned}$$

Such an inverse function exists if and only if  $f$  is bijective. In this case,  $f$  is called invertible. The notation  $g \circ f$  (or, in some texts, just  $gf$ ) and  $f^{-1}$  are akin to multiplication and reciprocal notation. With this analogy, identity functions are like the multiplicative identity, 1, and inverse functions are like reciprocals (hence the notation).

For this inverse function, we would observe, again, that  $f$  to the power of minus 1 equals one, and, that equals some other stuff with  $f$  being 'devoured,' so, the answer is just  $f$ , as it is a two way street - completing a equation on either side of the equals sign is the answer. then, if you want to continue, you take 9 times by 5 = 45, then subtract the sum of the two you were actually supposed to divide, leaving you with 31, plus 1!

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**Mathematical modeling.**



 Quote by: [http://en.wikipedia.org/wiki/Mathematical\\_model](http://en.wikipedia.org/wiki/Mathematical_model)

A mathematical model is a description of a system using mathematical concepts and language. The process of developing a mathematical model is termed mathematical modelling. Mathematical models are used not only in the natural sciences (such as physics, biology, earth science, meteorology) and engineering disciplines (e.g. computer science, artificial intelligence), but also in the social sciences (such as economics, psychology, sociology and political science); physicists, engineers, statisticians, operations research analysts and economists use mathematical models most extensively. A model may help to explain a system and to study the effects of different components, and to make predictions about behaviour.

Mathematical models can take many forms, including but not limited to dynamical systems, statistical models, differential equations, or game theoretic models. These and other types of models can overlap, with a given model involving a variety of abstract structures. In general, mathematical models may include logical models, as far as logic is taken as a part of mathematics. In many cases, the quality of a scientific field depends on how well the mathematical models developed on the theoretical side agree with results of repeatable experiments. Lack of agreement between theoretical mathematical models and experimental measurements often leads to important advances as better theories are developed.

 Quote by: [http://en.wikipedia.org/wiki/Mathematical\\_model](http://en.wikipedia.org/wiki/Mathematical_model)

Model of a particle in a potential-field. In this model we consider a particle as being a point of mass which describes a trajectory in space which is modeled by a function giving its coordinates in space as a function of time. The potential field is given by a function  $V:\mathbb{R}^3\rightarrow\mathbb{R}$  and the trajectory, that is a function  $\mathbf{r}:\mathbb{R}\rightarrow\mathbb{R}^3$ , is the solution of the differential equation:

$$-\frac{\mathrm{d}^2\mathbf{r}(t)}{\mathrm{d}t^2}m=\frac{\partial V[\mathbf{r}(t)]}{\partial x}+\frac{\partial V[\mathbf{r}(t)]}{\partial y}+\frac{\partial V[\mathbf{r}(t)]}{\partial z}$$

that can be written also as:

$$m\frac{\mathrm{d}^2\mathbf{r}(t)}{\mathrm{d}t^2}=-\nabla V[\mathbf{r}(t)].$$

Note this model assumes the particle is a point mass, which is certainly known to be false in many cases in which we use this model; for example, as a model of planetary motion.

The solution to this would be  $m + d + r + t = V$ , as the powers and multiplication in the top is echoed in the dividing factors at the bottom.

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### Mathematical probability theory.

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This could eventually be used along side one world conscious and social mathematics to tell the future. if something happens by chance, there is a chance it will happen again, and, statistically speaking, you can nearly predict the outcome. this is a complex field in mathematics.

 Quote by: [http://en.wikipedia.org/wiki/Probability\\_theory](http://en.wikipedia.org/wiki/Probability_theory)

Probability theory is the branch of mathematics concerned with probability, the analysis of random phenomena.[1] The central objects of probability theory are random variables, stochastic processes, and events: mathematical abstractions of non-deterministic events or measured quantities that may either be single occurrences or evolve over time in an apparently random fashion. If an individual coin toss or the roll of dice is considered to be a random event, then if repeated many times the sequence of random events will exhibit certain patterns, which can be studied and predicted. Two representative mathematical results describing such patterns are the law of large numbers and the central limit theorem.

As a mathematical foundation for statistics, probability theory is essential to many human activities that involve quantitative analysis of large sets of data. Methods of probability theory

*also apply to descriptions of complex systems given only partial knowledge of their state, as in statistical mechanics. A great discovery of twentieth century physics was the probabilistic nature of physical phenomena at atomic scales, described in quantum mechanics.*

This means,  $x$  should happen  $y$  times. or, it means  $x$  should happen if  $y$  is in effect. there is little between the two.

If you have a dice, and we will work with dice for the beginning, then you need to see that you have a one in six chance of rolling the dice to a specific number. the more you roll the dice the more chance of getting that number will happen. so, if we observe classical mechanics, we get  $x$  when  $x$  is rolled, and, the longer you roll the dice for, the more chance of getting a  $x$  is given.

Now, presume that the dice is actually a spoke or something, if the spoke is rotating, it will hit  $x$  a few times in the revolutions it goes through over the more time, the more likely to hit  $x$ . of course, seeing as how nothing is random, due to determinism, the spoke will roll a set number of times, in due time, yes? especially if the spoke's starting point is known, and in any problem, we should at least know that!

So, the spoke goes around  $a$  times and results in  $b$  times to face a certain way. if the time is more, the spoke will do more rotations no matter how slow it is going.

Now, the formula so far should be,  $x$  [will happen,] if [time equals]  $c$  but, we want to know if it is 'random' what the outcome will be. let's pretend there is a random?

So, [random]  $x$  will occur if time equals  $c$ , for definite, if the time allowed is enough to guarantee that a spoke will turn in a given chamber. of course using a dice is the next step, so hold on! if  $c$  equals  $d$ , then  $x$  will happen to the spoke. how much time? well, if a spoke moves at a rate of one turn a second, and there are four faces, then it will turn every four seconds. so,  $c = 4$ . that is the spoke.

Now for a dice, we would need to make doubly sure of some things, as, a dice is unpredictable, or is it? what in nature uses dice? what sort of thing would ever use the trickiness of a dice? you might roll it twenty times and never get a number you wish to have! so, we need to assign probability, but, seeing as how the universe is determined, all you need to know is how the dice is rolled, and where it is rolled onto. if you know it down to the bone, there is only one answer.

So, you desire  $x$  [number on dice], you got place rolling to  $[d]$  and you got energy behind throw  $[e]$ . to get  $x$  you need to say if  $[e]$  equals  $[y - \text{or the amount of energy put into it}]$ , and it is placed on  $[d \text{ equal to distance of throw}]$ , then you will get  $x$ .

This means,  $x = y + d$  basically. now, let's do something more complicated?


If a leaf is blowing in the wind, and it has two sides to it, and you want to know which side will be upright at whatever interval, you need to take  $x = y + d$ ! same old same, but that was easy...

Now, if a man is running away from a dog, and you want to know how fast they are running, and in which direction, you might need more symbols? you can only know one thing at a time, so, you will either make  $x$  equal the direction or the speed of the running man. this means,  $x = y + d$  again.

I really cannot think of anything else to add to it, as there are no more things i can think of that would actually be complicated.

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## **nth root.**

 Quote by: [http://en.wikipedia.org/wiki/Nth\\_root#Computing\\_principal\\_roots](http://en.wikipedia.org/wiki/Nth_root#Computing_principal_roots)  
*nth roots*[\[edit\]](#)

Every complex number has  $n$  different  $n$ th roots in the complex plane. These are  $\eta, \eta\omega, \eta\omega^2, \dots, \eta\omega^{n-1}$ ,

where  $\eta$  is a single  $n$ th root, and  $1, \omega, \omega^2, \dots, \omega^{n-1}$  are the  $n$ th roots of unity. For example, the four different fourth roots of 2 are  $\sqrt[4]{2}, \sqrt[4]{2}, \sqrt[4]{2}, \sqrt[4]{2}$  and  $-\sqrt[4]{2}$ .

In polar form, a single  $n$ th root may be found by the formula  $\sqrt[n]{re^{i\theta}}$ ,  $= \sqrt[n]{r}e^{i\theta/n}$ .


Here  $r$  is the magnitude (the modulus, also called the absolute value) of the number whose root is to be taken; if the number can be written as  $a+bi$  then  $r=\sqrt{a^2+b^2}$ . Also,  $\theta$  is the angle formed as one pivots on the origin counterclockwise from the positive horizontal axis to a ray going from the origin to the number; it has the properties that  $\cos \theta = a/r$ ,  $\sin \theta = b/r$ , and  $\tan \theta = b/a$ .

Thus finding  $n$ th roots in the complex plane can be segmented into two steps. First, the magnitude of all the  $n$ th roots is the  $n$ th root of the magnitude of the original number. Second, the direction of a ray from the origin to one of the  $n$ th roots involves an angle  $\theta/n$  relative to the positive horizontal axis that is *[clarification needed]*  $1/n$  times the angle  $\theta$  of a ray from the origin to the original number relative to the positive horizontal axis. Furthermore, all  $n$  of the  $n$ th roots are at equally spaced angles from each other. As with square roots, the formula above cannot be applied consistently to the entire complex plane, but instead leads to a branch cut at the points where  $\theta/n$  suddenly "jumps".*[clarification needed]*

If we want to find the roots of numbers, we need to basically see how many times the multiple of that number fits into the other. we can do this by taking the 'divisor' and multiplying it up to see how many times it fits into the  $n$ th term. if you were to observe powers, then you would multiply it by itself until it reaches the closest to the number it can, then observe the rest by dividing the remaining numbers by the power number on a calculator, or, if you are feeling a little crazy, use paper or your mind.

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## **Trigonometric functions.**

 Quote by: <http://en.wikipedia.org/wiki/Exponent>  
*Trigonometric functions*[\[edit\]](#)

Main article: *Euler's formula*

It follows from Euler's formula stated above that the trigonometric functions cosine and sine are

$$\cos(z) = \frac{e^{iz} + e^{-iz}}{2}; \quad \sin(z) = \frac{e^{iz} - e^{-iz}}{2i}$$

Historically, cosine and sine were defined geometrically before the invention of complex numbers. The above formula reduces the complicated formulas for trigonometric functions of a sum into the simple exponentiation formula

$$e^{i(x+y)} = e^{ix} \cdot e^{iy}$$



*Using exponentiation with complex exponents may reduce problems in trigonometry to algebra.*

We could cancel  $i$ , as  $i$  divided by  $i = 1$  so replace  $i$  with one in the answer. actually the answer is  $ei$  divided by  $2i$  as they cancel each other out.

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### Quadratic equations.

 Quote by: [http://en.wikipedia.org/wiki/Quadratic\\_equation](http://en.wikipedia.org/wiki/Quadratic_equation)

*In elementary algebra, a quadratic equation (from the Latin quadratus for "square") is any equation having the form*

$$ax^2+bx+c=0$$

*where  $x$  represents an unknown, and  $a$ ,  $b$ , and  $c$  are constants with  $a$  not equal to 0. If  $a = 0$ , then the equation is linear, not quadratic. The constants  $a$ ,  $b$ , and  $c$  are called, respectively, the quadratic coefficient, the linear coefficient and the constant or free term.*

*Because the quadratic equation involves only one unknown, it is called "univariate". The quadratic equation only contains powers of  $x$  that are non-negative integers, and therefore it is a polynomial equation, and in particular it is a second degree polynomial equation since the greatest power is two.*

*Quadratic equations can be solved by a process known in American English as factoring and in other varieties of English as factorising, by completing the square, by using the quadratic formula, or by graphing. Solutions to problems equivalent to the quadratic equation were known as early as 2000 BC.*

$$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}.$$

This is a quadratic equation, much simpler than what we previously dealt with, but here at last. because division comes before multiplication, subtraction and addition, due to bodmas [brackets, of, division, multiplication, addition, subtraction - in the order!] we could simply do the all the divisions first. the only triack is to do the brackets once you are going from left to right in the equation.

So, you should subtract the 'powers' from the 'divisible parts' so as to cancel out things you should be dividing. this will lead to, in this case, [on the right of the equals sign,] the  $[4ac / 4a^2]$  becoming  $[1ac]$  and  $[b^2]$  being divided by  $[1ac]$ . of course, if you know any of them, then you would be able to work it out, and usually you do know something therein. the people testing you use symbols to make sure you understand the whole process and are not just adding and subtracting.

But that was the right. if you have any more information, but for this you could say  $c = x$ . any unpaired values will equal each other, unless they are different, and, in real life, you will always have one of the values, yes?

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### More algebra.

If we are to get anywhere, we first need to be able to do algebra, as it is the base of maths in high school. basically, we want to get the answer quicker, and that means we need to get a quick fix to the simple problems.

Let's take  $x = 4a^3bc^2 / 5ab^8c$ ? this would be a long one to work out, as it is

quite complicated. so, we need to speed this up, yes? how would we speed it up? well, it would be great if we could break it down, but, i want to try to work it out as is, and quickly. i suppose you would like that too, so, here goes!

If we were to examine the identical entries, we come up with a b and c. all of them have a, b and c. if you were to examine the total of the powers on each side of the divide sign, we would come to  $[5 / 8]$  and this would be  $[0.625]$ . i am grabbing now, so let's see if that is right? this might take a while to work out, but if it works, it would be easier in future. so, we have  $[4a^2 / 5a]$  just to get a feel for where this is going, and that comes up at  $[0.8a^2]$  and that leads to 0.64 i think. then, we need to observe the rest, as this is quite close, isn't it? the other answer to  $[5 / 8]$  equals 0.625, rounding up to 0.6, which is the same as the 0.64 equaling 0.6, yes? let's look at the rest?

Now, we need to observe  $[b / b^8]$  and find 0.0156, which jumps out at 0.0 so there is nothing there.

Then, we need to get  $[c^2 / c]$  and find that  $[4/1 = 4]$  which equals 4.

Well, hopefully someone can complete this properly, but i definitely have a good feeling about this. i was advised to times the 0.64 by the 4, and that gives 2.56, rounded off to three, and that was  $5 / 8$ , yes?

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